

CLAIMS

What is claimed is:

1. A combination hood and microwave oven, comprising:
 - a variable suction hole ;
 - a variable suction hole motor allowing a suction area of the variable suction hole to vary;
 - an exhaust motor discharging air sucked through the variable suction hole outside ;
 - an exhaust motor drive unit controlling a rotational speed of the exhaust motor; and
 - a variable suction hole adjusting unit controlling the variable suction hole motor according to the rotational speed of the exhaust motor.
2. The combination hood and microwave oven as set forth in claim 1, wherein:
 - the exhaust motor rotates at a lower rotational speed and at a higher rotational speed; and
 - the variable suction hole motor increases the suction area of the variable suction hole when the exhaust motor rotates at the higher rotational speed, and decreases the suction area of the variable suction hole when the exhaust motor rotates at the lower rotational speed.
3. The combination hood and microwave oven as set forth in claim 1, wherein:
 - the variable suction hole motor maximally increases the suction area of the variable suction hole when the exhaust motor is rotated at a higher rotational speed; and
 - the variable suction hole motor decreases the suction area of the variable suction hole to a predetermined size when the exhaust motor is rotated at a lower rotational speed.
4. The combination hood and microwave oven as set forth in claim 1, wherein the exhaust motor drive unit comprises:
 - a first exhaust switch allowing the exhaust motor to be rotated at the higher rotational speed; and
 - a second exhaust switch allowing the exhaust motor to be rotated at the lower rotational speed.

5. The combination hood and microwave oven as set forth in claim 1, wherein the exhaust motor drive unit comprises:

a first relay having first normally closed contact points and first normally open contact points, and is excited by the first exhaust switch so that the first normally closed contact points open and the first normally open contact points close; and

a second relay having second normally open contact points and is excited by the second exhaust switch so that the second normally open contact points close, wherein

the first normally open contact points of the first relay are connected between a power supply terminal and the exhaust motor, and

the first normally closed contact points of the first relay and the second normally open contact points of the second relay are connected in series between the power supply terminal and the exhaust motor, and are connected in parallel to the first normally open contact points of the first relay.

6. The combination hood and microwave oven as set forth in claim 5, wherein the variable suction hole adjusting unit comprises:

a first switch connected between the first normally closed contact points and a first terminal of the variable suction motor so that power provided through the first normally closed contact points of the exhaust motor drive unit is transmitted to the first terminal, and is turned on when the exhaust motor is rotated at a higher rotational speed; and

a second switch connected between the first normally open contact points and a second terminal of the variable suction motor so that power provided through the first normally open contact points of the exhaust motor drive unit is transmitted to the second terminal, and is turned on when the exhaust motor is rotated at a lower rotational speed.

7. The combination hood and microwave oven as set forth in claim 6, wherein the first switch is a limit switch turned off at the time the suction area of the variable suction hole is decreased to have a predetermined size, and the second switch is a limit switch turned off at the time the suction area of the variable suction hole is increased to have a maximal size.

8. A combination hood and microwave oven, comprising:
a control unit, controlling the overall operation of the microwave oven, having at least first and second terminals;
an exhaust motor drive unit connected to one of the first and second terminals; and
a variable suction hole adjusting unit connected to the other one of the first and second terminals.

9. The combination hood and microwave oven as set forth in claim 8, further comprising an exhaust motor wherein the exhaust motor drive unit is coupled to the exhaust motor to control a rotational speed of the exhaust motor.

10. The combination hood and microwave oven as set forth in claim 9, further comprising a variable suction hole motor wherein the variable suction hole adjusting unit is coupled to the variable suction hole motor to open and close the variable suction hole according to the rotational speed of the exhaust motor.

11. The combination hood and microwave oven as set forth in claim 10, wherein:
the exhaust motor rotates at a lower rotational speed and at a higher rotational speed;
and

the variable suction hole motor increases the suction area of the variable suction hole when the exhaust motor rotates at the higher rotational speed, and decreases the suction area of the variable suction hole when the exhaust motor rotates at the lower rotational speed.

12. The combination hood and microwave oven as set forth in claim 10, wherein:
the variable suction hole motor maximally increases the suction area of the variable suction hole when the exhaust motor rotates at a higher rotational speed; and
the variable suction hole motor decreases the suction area of the variable suction hole to a predetermined size when the exhaust motor rotates at a lower rotational speed.

13. The combination hood and microwave oven as set forth in claim 10, wherein the exhaust motor drive unit comprises:

a first exhaust switch that allows the exhaust motor to be rotated at a higher rotational speed; and

a second exhaust switch that allows the exhaust motor to be rotated at a lower rotational speed.

14. The combination hood and microwave oven as set forth in claim 10, wherein the exhaust motor drive unit further comprises:

a first relay having first normally closed contact points between a power supply terminal and the exhaust motor and first normally open contacts points; and

a second relay having second normally open contact points which are connected in series to the first normally closed contact points between the power supply terminal and the exhaust motor, and which are connected in parallel to the first normally open contact points; wherein

when the first exhaust switch excites the first relay, the first normally closed contact points open and the first normally open contact points close, and

when the second exhaust switch excites the second relay, the second normally open contact points close.

15. The combination hood and microwave oven as set forth in claim 14, wherein the variable suction hole adjusting unit comprises:

a first switch connected between the first normally closed contact points and a first terminal of the variable suction motor so that power provided through the first normally closed contact points of the exhaust motor drive unit is transmitted to the first terminal, and is turned on when the exhaust motor is rotated at the higher rotational speed; and

a second switch connected between the first normally open contact points and a second terminal of the variable suction motor so that power provided through the first normally open contact points of the exhaust motor drive unit is transmitted to the second terminal, and is turned on when the exhaust motor is rotated at the lower rotational speed.

16. The combination hood and microwave oven as set forth in claim 15, wherein the first switch is a limit switch turned off at the time the suction area of the variable suction hole is decreased to have a predetermined size, and the second switch is a limit switch turned off at the time the suction area of the variable suction hole is increased to have a maximal size.

17. A combination hood and microwave oven, including a power supply, an exhaust motor, a variable suction hole having a variable suction area, and a variable suction hole drive motor, comprising:

a control unit controlling an operation of the microwave oven;

an exhaust motor drive unit, connected to the control unit, to control an on and off operation of the exhaust motor and to control a rotational speed of the exhaust motor; and

a variable suction hole adjusting unit, connected to the control unit, to control the suction area of the variable suction hole by changing a rotating direction of the variable suction hole drive motor.

18. The combination hood and microwave oven according to claim 17, further comprising:

an input unit; and

a sensor unit, wherein the control unit comprises terminals connected to the input unit and the sensor unit.

19. The combination hood and microwave oven according to claim 17, further comprising:

a magnetron drive unit to drive a magnetron to generate microwaves;

a cooling fan drive unit, including a cooling fan, to drive the cooling fan to prevent electrical parts from overheating;

a tray drive unit to rotate a tray; and

a display drive unit to display a help menu and cooking information, wherein the control unit comprises output terminals connected to the magnetron drive unit, the cooling fan drive unit, the tray drive unit, the display drive unit, the exhaust motor drive unit, and the variable suction hole drive unit.

20. The combination hood and microwave oven according to claim 17, wherein the exhaust motor drive unit comprises:

a first exhaust switch; and

a second exhaust switch, wherein the exhaust motor drive unit controls the rotating speed of the exhaust motor according to the on and off state of the first and second exhaust switches.

21. The combination hood and microwave oven according to claim 20, wherein the exhaust motor drive unit further comprises:

a first relay having normally open contact points and normally closed contact points; and
a second relay having normally open contact points, wherein

the normally open contact points of the first relay are connected between the power supply and the exhaust motor, and the normally closed contact points of the first relay are connected in series to the normally open contact points of the second relay and between the power supply and the exhaust motor, and

when the normally open contact points are excited, the normally open contact points are shortened and become electrically connected, and when the normally closed contact points are excited, the normally closed contact points open and become electrically disconnected.

22. The combination hood and microwave oven according to claim 21, wherein the variable suction hole adjusting unit further comprises:

a first limit switch, mutually turned off and connected in series to the normally closed contact points of the first relay, to allow power to be supplied to the variable suction hole drive motor when the normally closed contact points of the first relay are close; and

a second limit switch, mutually turned on and connected in series to the normally open contact points of the first relay, to allow power to be supplied to the variable suction hole drive motor when the normally open contact points are closed.

23. The combination hood and microwave oven according to claim 22, wherein when the normally open contact points of the first relay are closed, the exhaust motor is rotated at a high speed and power is supplied to the variable suction hole drive motor to rotate the variable suction hole drive motor forward, thereby opening the variable suction hole.

24. The combination hood and microwave oven according to claim 23, wherein, by being automatically turned off, the second limit switch allows the variable suction hole drive motor to be stopped.

25. The combination hood and microwave oven according to claim 24, wherein when the normally closed contact points of the first relay are closed, the exhaust motor is rotated at a low speed and power is supplied to the variable suction hole drive motor to rotate the variable suction hole drive motor in reverse, thereby closing the variable suction hole.

26. The combination hood and microwave oven according to claim 25, wherein, by being automatically turned off, the second limit switch allows the variable suction hole drive motor to be stopped.

27. The combination hood and microwave oven according to claim 26, wherein the control unit examines the states of the normally open contact points of the first and second relays of the exhaust motor drive unit to determine the rotational speed of the exhaust motor.

28. The combination hood and microwave oven according to claim 26, wherein the control unit examines the rotational speed of the exhaust motor by directly detecting the rotational speed of the exhaust motor and comparing the detected speed with a reference value.

29. A method to operate a combination hood and microwave oven, including an exhaust motor drive unit, to drive an exhaust motor, having first and second exhaust switches coupled to first and second relays, respectively, the first relay having normally open and normally closed contact points, and the second relay having normally open contact points, and a variable suction hole adjusting unit to rotate a variable suction hole drive motor in forward and reverse directions to open and close, respectively, a variable suction hole, comprising:

turning the second exhaust switch on while the first exhaust switch is turned off thereby exciting the first relay and closing the normally open contact points of the first relay;

supplying power to the exhaust motor, through the normally open contact points of the second relay, which are closed, and the normally closed contact points of the first relay which are closed, to rotate the exhaust motor at low speed; and

supplying power to the variable suction hole adjusting unit to rotate the variable suction hole drive motor in reverse, thereby closing the variable suction hole.

30. A method to operate a combination hood and microwave oven, including an exhaust motor drive unit, to drive an exhaust motor, having first and second exhaust switches, coupled to first and second relays, respectively, the first relay having normally open and normally closed contact points, and the second relay having normally open contact points, and a variable suction hole adjusting unit to rotate a variable suction hole drive motor in forward and reverse directions to open and close, respectively, a variable suction hole, comprising:

turning the first exhaust switch on while the second exhaust switch is turned on thereby exciting the first relay and closing the normally open contact points of the first relay;

supplying power to the exhaust motor, through the normally open contact points of the first relay, which are closed; and

supplying power to the variable suction hole adjusting unit to rotate the variable suction hole drive motor forward, thereby opening the variable suction hole.

31. A combination hood and microwave oven, including a power supply, an exhaust motor and a variable suction hole having a variable suction area, comprising:

a control unit controlling an operation of the microwave oven;

an exhaust motor drive unit, connected to the control unit, to control an on and off operation of the exhaust motor and to control a rotational speed of the exhaust motor; and

a variable suction hole adjusting unit, connected to the control unit, to control the suction area of the variable suction hole according to the rotational speed of the exhaust motor.